

Enclosure B

Allocation of Past Costs Among Problem Areas
Commencement Bay - Nearshore/Tideflats Superfund Site



May 18, 1990

Reply To
Attn Of: HW-113

RE: Allocation of Past Costs Among Problem Areas
Commencement Bay - Nearshore/Tideflats Superfund Site

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Approval

The purpose of this memo is to document the completion of an analysis of past response costs for the Commencement Bay - Nearshore/Tideflats (CB/NT) Superfund site. The analysis has been developed in order to allocate past response costs among the nine CB/NT problem areas identified in the CB/NT Record of Decision (ROD). The analysis covers specific costs incurred by the U.S. Environmental Protection Agency (EPA) during response and investigation activities leading up to completion of the ROD on September 30, 1989. Those costs total \$5,138,197. Recovery of problem-area specific allocations of past costs will be negotiated with separate groups of Potentially Responsible Parties (PRPs) which are currently being identified for each problem area.

The analysis of past response costs is presented in four sections. The first section briefly describes EPA's response activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, commonly known as Superfund) at the CB/NT site, and the areas of the site covered by this analysis. The second section explains the purpose of this cost analysis and summarizes the development and documentation of relevant EPA response costs. The third section describes the method which was selected to allocate past costs among the nine CB/NT problem areas. The fourth section presents the final results of the analysis (i.e., the past response cost allocation for each problem area).

CB/NT SITE BACKGROUND

As described in the CB/NT ROD, EPA's Superfund response actions in the Commencement Bay area have evolved from area-wide investigations to cleanup strategies which are now focused on more discrete problem areas. The original Commencement Bay site was identified on EPA's Interim Priority List in October 1981 and included four areas: Deepwater, Nearshore, Tideflats Industrial, and the South Tacoma Channel. On September 6, 1983, EPA published and promulgated the first official National Priorities List of hazardous waste sites which identified two separate Commencement Bay sites: the Commencement Bay - Nearshore/ Tideflats (CB/NT) site and the Commencement Bay - South Tacoma Channel site. The Deepwater area was dropped from further consideration under Superfund at that time.

CB/NT Operable Units

Superfund response actions for the CB/NT site have continued to evolve and are currently coordinated under six separate operable units:

- Operable Unit 01 - CB/NT Sediments
- Operable Unit 02 - Asarco Tacoma Smelter
- Operable Unit 03 - Tacoma Tarpits
- Operable Unit 04 - Asarco Off-Property
- Operable Unit 05 - CB/NT Sources
- Operable Unit 06 - Asarco Sediments

Each of these operable units is further described in the CB/NT ROD in relation to EPA's comprehensive remedial response for the entire CB/NT site. However, the selected remedy documented in the ROD is specific to Operable Unit 01 (CB/NT Sediments) and Operable Unit 05 (CB/NT Sources). By convention the site name (i.e., CB/NT) refers to those same operable units and that convention is used in all other sections of this memo. RODs for the other CB/NT operable units either have been or will be developed separately.

CB/NT Record of Decision

The CB/NT ROD was completed and signed by the EPA Regional Administrator on September 30, 1989. It represents the completion of a long and complicated study phase for the CB/NT site. The ROD documents the selected remedy for eight problem areas which are each characterized as a combination of: 1) chemically contaminated marine sediments and 2) a localized drainage basin including the sources of those contaminants. The eight problem areas addressed in the CB/NT ROD are: Head of Hylebos Waterway, Mouth of Hylebos Waterway, Sitcum Waterway, St. Paul Waterway, Middle Waterway, Head of City Waterway, Wheeler-Osgood Waterway, and Mouth of City Waterway.

An additional priority problem area, the Ruston Shoreline, was included in the CB/NT Remedial Investigation and Feasibility Study (RI/FS), and also briefly described in the CB/NT ROD. However, a final decision on the remedy for that problem area was not provided in the ROD. Instead, the Ruston Shoreline was designated as Operable Unit 06 (Asarco Sediments). EPA is currently developing a supplemental FS for Operable Unit 06 which will be submitted for public review and comment later this year.

The CB/NT ROD defines the selected remedy for each problem area in terms of five key elements: 1) site use restrictions, 2) source control, 3) natural recovery, 4) sediment remediation, and 5) monitoring. In general, these elements will be implemented according to a two-step approach: source control followed by sediment remediation. During the cleanup phase, the Washington Department of Ecology (Ecology) will have the lead for source control and EPA will have the lead for sediment remediation. The roles and responsibilities of EPA and Ecology are summarized in the ROD and further described in an EPA Cooperative Agreement entered into with Ecology on June 30, 1989.

Project Implementation

Due to the scope and complexity of the CB/NT site, the ROD provides for flexible implementation of the remedy. In general, however, continuing response actions will proceed on a sequential basis for each problem area, as described in the CB/NT ROD. The timing of sediment remediation in any problem area will be determined according to a number of factors, the most important being the status of source control. Other areas of the CB/NT site, such as the Blair Waterway, and any environmental or public health problems not germane to the goals and objectives of the CB/NT site (i.e., not associated with the marine environment) are not within the scope of activities addressed by the ROD.

Some other important factors in the current site management strategy include the following:

- On April 24, 1989, during the public comment period for the Remedial Investigation/Feasibility Study (RI/FS), EPA issued CERCLA general notice letters to 133 PRPs for the CB/NT site.
- A PRP search is ongoing. It is designed to finalize separate lists of PRPs who may be held liable for past response costs and sediment remediation in each of the nine CB/NT problem areas. EPA will issue CERCLA special notice letters to the identified PRPs for each problem area in order to commence sediment remedial action and recover past costs.
- On April 28, 1989, a Cooperative Agreement between EPA and the Puyallup Tribe of Indians was approved, establishing the

tribe as a supporting agency for remedial activities at the CB/NT site.

- On June 30, 1989, a Cooperative Agreement between EPA and Ecology was approved which establishes Ecology's Urban Bay Action Team (UBAT) as the lead agency team for source control at the site.
- On December 14, 1989, EPA held the first Technical Discussion Group (TDG) meeting in Tacoma, Washington. The TDG has been established to provide a forum for review and discussion of technical and planning information between the regulatory agencies and the affected community. Meetings are scheduled to continue on a quarterly basis.

Since completion of the ROD, EPA efforts have focused on oversight of the Cooperative Agreement with Ecology to ensure implementation of the source control process, coordination with the natural resource trustees during their efforts to assess natural resource damages, continuation of the PRP search for each of the nine problem areas, implementation of several sediment-related projects and issues, and community relations activities intended to coordinate local development projects with ongoing response actions at the CB/NT site.

COST RECOVERY ACTIVITIES

Purpose of Problem-area Specific Cost Allocation

The gradual focusing of attention on specific problem areas within the CB/NT site is typical of the Superfund process, especially during the pre-remedial and RI/FS phases. This process involves sample collection and analysis to determine the nature and extent of contamination, including confirmation of non-problem areas. Cost recovery efforts by EPA necessarily address costs incurred during the investigation of the entire site, despite the fact that some portions of the site may not warrant further remedial action. Similarly, area-wide costs for the CB/NT site, and costs which are directly attributable to non-problem areas, such as the Blair Waterway, have been allocated to those PRPs associated with the nine CB/NT problem areas.

Under CERCLA, all PRPs are jointly and severally liable for response and investigation costs incurred by EPA at the CB/NT site. As stated previously, however, EPA intends to negotiate separately with different groups of PRPs for each problem area. Therefore, despite the joint and several liability scheme of CERCLA, which is applicable for recovery of EPA's response costs on an area-wide basis, it is EPA's intention to hold individual PRPs liable for costs attributable to the specific problem area(s) with which they are associated. Although EPA has therefore performed a cost allocation on a problem-area basis, this analysis is not meant to

be interpreted as an attempt to allocate response costs among specific PRPs. It will be the responsibility of the PRPs within any given problem area to further allocate problem area response costs among individuals for the purpose of settlement with EPA.

Development of Past Response Costs

Past response and investigation costs for the CB/NT site addressed in this analysis have been developed under the direction of the EPA Region 10 Superfund Program Management Section. These costs include EPA costs associated with site-related activities such as pre-remedial investigations, the CB/NT Remedial Investigation and Feasibility Study (RI/FS), the public comment period on the RI/FS, and the development and completion of the CB/NT ROD. The majority of these costs were incurred by EPA during development of the CB/NT RI/FS, which included areas of the site now managed under Operable Unit 01 (CB/NT Sediments), Operable Unit 05 (CB/NT Sources), and Operable Unit 06 (Asarco Sediments). Additional response costs were incurred in association with the original Commencement Bay site. Documentation of the combined response costs for the CB/NT site and for a portion of the original Commencement Bay site which are addressed by this cost analysis are described below.

Past costs for the CB/NT site were developed by the Contract Evidence Audit Team (CEAT-Techlaw) under assignment to the National Enforcement Investigations Center (NEIC). The Contract Evidence Audit Team's Final Cost Recovery Report was completed on March 16, 1990 and is available for public review as part of the CB/NT site file. It is an eight volume report which documents the following types of EPA costs: EPA payroll costs, EPA indirect costs, EPA travel costs, laboratory costs, contractor costs, and cooperative agreement costs. The CB/NT site costs documented in the report total \$4,871,377.

Past EPA response costs for the original Commencement Bay site, which were developed by the Superfund Program Management Section, total \$538,340. However, because the original site was subsequently split into two sites, the CB/NT site and the Commencement Bay - South Tacoma Channel site, the original costs have been divided among those two sites. In some cases costs are clearly associated with one site or the other and have been allocated accordingly. Commencement Bay site costs directly attributable to the CB/NT site total \$36,367. Costs which cannot be directly associated with either site total \$460,906 and have been allocated equally between the two. The original Commencement Bay site costs which have therefore been allocated to the CB/NT site total \$266,820. Documentation of the original Commencement Bay site costs attributable to the CB/NT site is also available for public review in the CB/NT site file.

The past response costs for the CB/NT site addressed in this analysis have been derived by summing the relevant costs listed above for the CB/NT site and for the original Commencement Bay site. The combined total is \$5,138,197.

METHOD OF ALLOCATING COSTS AMONG PROBLEM AREAS

The following method of allocating past response costs among CB/NT problem areas has been selected because it provides the most straightforward and equitable approach for distributing area-wide project costs among the nine specific problem areas. The method utilizes weighting factors to determine the portion of overall site costs attributable to a particular problem area. The weighting factors are developed from numerical data and are used as multipliers to determine the fraction of overall past response costs attributable to each specific problem area. Three specific weighting factors have been selected as cost indicators for different types of response activities within the overall EPA effort required during the CB/NT study phase. Once calculated, the weighting factors provide a means of fairly allocating past response costs for the CB/NT site on a problem-area basis. In this section the weighting factors are described, the reasons for their selection are explained, and the various data from the CB/NT RI/FS and ROD which have been used to calculate each weighting factor are identified.

Identification of Weighting Factors

Past response costs have been allocated to each of the nine CB/NT problem areas based on the following equally weighted factors:

1. Samples - The number of environmental samples collected from various media directly adjacent to and within the problem area;
2. Sources - The number of major potential sources of contamination identified for each problem area; and
3. Volume - The total volume of sediment exceeding the cleanup goal in the problem area.

Each of these weighting factors can be easily generated from numerical data which exist in the RI/FS and ROD.

Assumptions and Rationale

The use of weighting factors to allocate response costs assumes that there is a positive correlation between the number of direct field measurements (e.g., samples) and response costs associated with a portion of overall project implementation activities (e.g., management, sampling, analytical, and oversight

activities). The assumptions associated with each cost-related weighting factor are described below:

1. Samples - There is a positive correlation between the number of samples collected in any given problem area and overall efforts to characterize the site and develop methodologies for evaluating sediment toxicity. This assumption is reasonable because all aspects of project management clearly increased with the range and complexity of the problem chemicals found in bottom sediments, including the number of samples needed to characterize a particular problem area (i.e., the weighting factor).

2. Sources - Similarly, the number of major potential sources associated with a specific problem area correspond well with the overall project efforts related to source identification, estimation of source loading, and evaluation of the feasibility of source control and the potential for natural recovery.

3. Volume - The RI/FS was complicated by the unusual nature and volume of contaminated marine sediments and the subsequent need to evaluate appropriate remedial alternatives such as: dredging and dredge material transport technologies, large scale treatment systems, and disposal site feasibility and availability. Furthermore, each of these project components was significantly complicated in proportion to the volume of sediments under consideration for remediation.

Although arguments could be made for alternative methods of cost allocation among problem areas, or utilization of different weighting factors, the combination of weighting factors described above provides a reasonable and equitable means of distributing past costs among the nine CB/NT problem areas. Deletion of any of the selected weighting factors would tend to provide a less equitable allocation.

For example, developing a cost breakdown based on only site characterization and source control evaluation would result in a complex problem area such as the Head of Hylebos, which includes both multiple problem chemicals and sources, incurring a larger cost allocation factor than a more simple one such as the St. Paul, which includes limited sources and a relatively homogeneous problem area. This would not adequately consider the fact that the site is characterized, in general, by large volumes of material (i.e., sediments) which are contaminated at relatively low levels.

However, by utilizing a cost allocation factor weighted on volume, the analysis of past response costs takes into account many of the complexities of the project which were necessarily incorporated in the evaluation of remedial alternatives involving contaminated marine sediments. Thus a very large problem area,

such as the one off-shore of the Asarco facility (CB/NT Operable Unit 06), is subject to a proportionately higher cost allocation factor, despite the fact that it is relatively simple in terms of source identification and problem area evaluation. The volume factor therefore takes into account the substantial effort that was required to evaluate remedial alternatives involving extensive environmental impact to contaminated marine sediments.

Calculation of Cost Allocation Factors

The cost allocation factors used in this analysis have been generated from data which is easily retrievable from the RI/FS reports and the ROD.

1. Samples - The number of environmental samples per problem area (i.e., water, biota, suspended particulates and sediments) was generated from the RI/FS database by Tetra Tech, Inc., Ecology's remedial contractor for the project and an EPA TES IV contractor for the project (see Attachment 1).
2. Sources - The number of sources per problem area was computed from the major sources identified in Appendix C of the CB/NT ROD (see Attachment 2). Although source control efforts by Ecology include other properties, only those sources characterized as major were included in RI/FS evaluations regarding source control and the potential for natural recovery.
3. Volume - The volume of contaminated sediments was developed in the CB/NT FS, based on predicted exceedance of the sediment quality objective (Long-Term Goal) for the site (see Attachment 3). The basis for these numbers was confirmed in the CB/NT ROD. Although the Asarco Sediments problem area is still being evaluated in terms of required remediation, EPA's determination of the overall extent of the problem area, as described in the CB/NT FS, will not likely be adjusted in subsequent reports.

In each case, the three weighting factors are derived for a specific problem area by simply calculating the percent of the overall number for each weighting factor which corresponds to the specific problem area of concern. For example, in the ROD the total number of major sources identified for the nine problem areas is 24, and the number of major sources in Middle Waterway is 2. Therefore, the cost-related weighting factor for sources in Middle Waterway is 8.3 percent.

FINAL COST ALLOCATION AMONG CB/NT PROBLEM AREAS

A final allocation of past response costs for the CB/NT site has been developed, based on the cost-related weighting factors described above. The results of that allocation are listed in this

section (see table). The average of the three weighting factors for a specific problem area has been used as a cost-related multiplier (i.e., cost fraction) to determine the portion of overall past response costs attributable to the problem area in question.

The total EPA response costs attributable to the nine CB/NT problem areas is \$5,138,197 through September 30, 1989. Note that all management and field effort costs for non-problem areas, such as the Blair Waterway, are proportionately distributed among problem areas in this cost allocation analysis.

CB/NT COST ALLOCATION PER PROBLEM AREA

<u>Problem Area</u>	<u>Samples^a</u>		<u>Sources^b</u>		<u>Volume^c</u>		<u>Multiplier^d</u>	<u>Cost^e</u>
H of Hylebos	329	20.8%	9	37.5%	381	13.4%	0.239	1,228,029
M of Hylebos	180	11.4%	1	4.2%	786	27.7%	0.144	739,900
Sitcum	155	9.8%	2	8.3%	167	5.9%	0.080	411,056
St. Paul	131	8.3%	1	4.2%	236	8.3%	0.069	354,536
Middle	135	8.5%	2	8.3%	63	2.2%	0.063	323,706
H of City	157	9.9%	6	25.0%	575	20.3%	0.184	945,428
Wheeler-Osgood	63	4.0%	1	4.2%	11	0.4%	0.029	149,008
M of City	131	8.3%	1	4.2%	27	1.0%	0.045	231,219
Ruston Shore	303	19.1%	1	4.2%	588	20.7%	0.147	755,315
TOTAL	1584	100%	24	100%	2834	100%	1.000	5,138,197

a = samples for all environmental media totaled from RI/FS (see Attachment 1)

b = list of major sources per waterway as described in Appendix C of CB/NT ROD (see Attachment 2)

c = volume of sediment exceeding cleanup goal reported in units of 1,000 yd³, as listed in Table 14-2 of CB/NT Feasibility Study (see Attachment 3)

d = average of weighting factors for samples, sources and volume of sediments, converted to a fraction multiplier

e = problem-area specific allocation of past EPA response costs, derived by using multiplier to determine fraction of area-wide cost (i.e., total of \$4,871,377 for CB/NT site and \$266,820 for CB/NT share of original Commencement Bay site)

CONCLUSION

The cost analysis described in this memo provides a reasonable and equitable method of allocating past response costs incurred by EPA among the nine CB/NT problem areas. The costs addressed by this analysis include all past EPA response costs associated with Operable Units 01 (Sediments) and 05 (Sources) of the CB/NT site through September 30, 1989. EPA will negotiate with PRPs in each problem area for recovery of these costs and any additional response costs incurred by the agency from that time forward. In order to facilitate negotiations, this memo and the Final Cost Recovery Report developed for the site will be made available in the CB/NT site file for review upon request.

ATTACHMENT 1
SAMPLE TYPES AND NUMBERS

The number of environmental samples collected from various media during the Remedial Investigation and Feasibility Study for the Commencement Bay - Nearshore/Tideflats site are listed below. Although samples are listed for problem areas and non-problem areas, only the problem area samples were used in the weighting factor calculations.

	Water	Surface Sediment	Biota	Suspended Particulates	Subsurface Sediment	Total Sample #
NON-PROBLEM AREA						
Blair	20	86	203	16	63	388
Commencement Bay	0	3	1	0	0	4
Carr Inlet	0	25	141	0	0	166
Milwaukee	12	23	72	8	14	129
Puget Sound River	10	0	0	8	0	18
SLBTOTAL	42	137	417	32	77	705

	Water	Surface Sediment	Biota	Suspended Particulates	Subsurface Sediment	Total Sample #					
PROBLEM WATERWAYS											
Head of City	8	15%	27	8%	70	9%	8	16%	44	11%	157
Mouth of City	10	19%	20	6%	68	9%	8	16%	25	6%	131
Wheeler-Osgood	2	4%	15	5%	0	0%	0	0%	46	11%	63
Head of Hylebos	12	22%	74	23%	135	18%	12	24%	96	23%	329
Mouth of Hylebos	12	22%	52	16%	66	9%	13	27%	37	9%	180
Middle	0	0%	22	7%	69	9%	0	0%	44	11%	135
Ruston-Pt. Defiance	0	0%	54	17%	200	27%	0	0%	49	12%	303
Sitcum	10	19%	26	8%	71	10%	8	16%	40	10%	155
St. Paul	0	0%	30	9%	68	9%	0	0%	33	8%	131
SLBTOTAL	54	100%	320	100%	767	100%	49	100%	414	100%	1584
TOTAL	96		457		1164		81		491		2289

ATTACHMENT 2
MAJOR SOURCES OF CONTAMINATION

The properties listed below were specified as major potential sources of problem chemicals to the Commencement Bay - Nearshore/Tideflats problem areas in the Record of Decision (September 30, 1989).

Head of Hylebos

- | | |
|--------------------------|--------------------------|
| 1. Kaiser Aluminum | 2. Pennwalt Chemical |
| 3. General Metals | 4. 3009 Taylor Way LSY |
| 5. Wasser Winters LSY | 6. Louisiana Pacific LSY |
| 7. Cascade Timber #2 LSY | 8. B&L Landfill |
| 9. Tacoma Boat | |

Mouth of Hylebos

1. Occidental Chemical Corporation

Sitcum

1. Port of Tacoma (Terminal 7)
2. Storm Drain SI-172

St. Paul

1. Simpson Tacoma Kraft

Middle

1. Cooks Marine Specialties
2. Marine Industries N.W

Head of City

- | | |
|-----------------------|--------------------------|
| 1. American Plating | 2. Martinac Shipbuilding |
| 3. Storm Drain CN-237 | 4. Storm Drain CN-237 |
| 5. Storm Drain CI-230 | 6. Tacoma Spur |

Wheeler - Osgood

1. Storm Drain CW-254

Mouth of City

1. D Street Petroleum

Ruston Shoreline

1. Asarco Tacoma Smelter

ATTACHMENT 3
SEDIMENT VOLUMES

The table presented below is excerpted from the Commencement Bay - Nearshore/Tideflats Feasibility Study. It lists the total volume of sediments exceeding the Long-term Cleanup Goal for each of the nine priority problem areas.

TABLE 14-2. SUMMARY OF REMEDIAL SEDIMENT SURFACE AREAS AND VOLUMES^a

Waterway	Long-Term Cleanup Goal ^b		Long-Term Cleanup Goal Plus 10-yr Recovery		Maximum AET ^c	
	Area	Volume	Area	Volume	Area	Volume
Head of Hylebos	381	381	217	217	9	9
Mouth of Hylebos	393	786	115	230	33	66
Sitcum	167 ^d	167 ^d	66 ^d	66 ^d	20	20
St. Paul	118	236	87	174	90	180
Middle	126	63	114	57	47	24
Head of City	230	575	171	426	42	104
Wheeler-Osgood	22	11	22	11	1	1
Mouth of City	27 ^d	27 ^d	0	0	0	0
Ruston-Pt. Defiance Shoreline	1,176	588	1,150	575	618	309
TOTAL	2,640	2,834	1,942	1,756	860	713

^a Areas are reported in units of 1,000 yd². Volumes are reported in units of 1,000 yd³.

^b Sediments with indicator chemical concentrations currently greater than long-term cleanup goals.

^c Sediments with indicator chemical concentrations currently greater than the lower of either the highest AET or the lowest "severe effects" AET.

^d Includes sediment for which biological effects were observed for nonindicator compounds.